

# **INDOOR AIR QUALITY ASSESSMENT**

**Claypit Hill Elementary School  
40 Adams Lane  
Wayland, MA**



Prepared by:  
Massachusetts Department of Public Health  
Bureau of Environmental Health  
Indoor Air Quality Program  
March 2019

## BACKGROUND

<b>Building:</b>	Claypit Hill Elementary School (CHES)
<b>Address:</b>	40 Adams Lane, Wayland, MA
<b>Assessment Requested by:</b>	Susan Bottan, Director of Finance & Operations, Wayland Public Schools
<b>Reason for Request:</b>	General indoor air quality (IAQ)
<b>Date of Assessment:</b>	March 1, 2019
<b>Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment:</b>	Ruth Alfasso, Environmental Engineer/Inspector and Jason Dustin, Environmental Analyst/Inspector, IAQ Program
<b>Building Description:</b>	The CHES is a single-story building originally built in in the 1950s with several additions including a set of modular classrooms installed in the late 1990s. The building has a brick and concrete block exterior and a flat roof.
<b>Windows:</b>	Openable

## METHODS

Please refer to the IAQ Manual and appendices for methods, sampling procedures, and interpretation of results (MDPH, 2015).

## RESULTS and DISCUSSION

The following is a summary of indoor air testing results (Table 1).

- ***Carbon dioxide*** levels were above the MDPH recommended level of 800 parts per million (ppm) in more than half of the areas surveyed, which indicates a lack of air exchange in many classrooms at the time of assessment.
- ***Temperature*** was within or close to the lower end of the MDPH recommended range of 70°F to 78°F in occupied areas apart from one reading of 62°F in a modular classroom.
- ***Relative humidity*** was below the MDPH recommended range of 40 to 60% in all areas tested the day of assessment, which is typical of conditions during the heating season.
- ***Carbon monoxide*** levels were non-detectable (ND) in all areas tested.

- **Particulate matter (PM<sub>2.5</sub>)** concentrations measured were below the National Ambient Air Quality (NAAQS) level of 35 µg/m<sup>3</sup> in all areas tested.

A heating, ventilating and air conditioning (HVAC) system has several functions. First it provides heating and, if equipped, cooling. Second, it is a source of fresh air. Finally, an HVAC system will dilute and remove normally-occurring indoor environmental pollutants by not only introducing fresh air, but by filtering the airstream and ejecting stale air to the outdoors via exhaust ventilation. Even if an HVAC system is operating as designed, point sources of respiratory irritation may exist and cause symptoms in sensitive individuals.

Fresh air in most classrooms is supplied by unit ventilators (univents)( Picture 1). Univents draw air from the outdoors through a fresh air intake located on the exterior wall of the building (Picture 2) and return air through an air intake located at the base of the unit. Fresh and return air are mixed, filtered, heated or cooled and provided to rooms through an air diffuser located in the top of the unit ([Figure 1](#)).

In many rooms the top and/or front of univents were blocked by classroom items and furniture (Picture 3). In order for univents to provide fresh air as designed, intakes/returns must remain free of obstructions. Importantly, these units must remain on and be allowed to operate while rooms are occupied. It is also important to note that outside air is typically limited (by adjusting intake louvers) during cold/winter months to provide comfort and prevent the freezing of pipes.

Rooftop air handling units (AHU) supply fresh air and exhaust for classrooms in the modular section and many common areas and offices. Air circulation should be on during occupied periods.

In some areas, exhaust vents did not appear to be drawing air (Table 1). This may be due to deactivation by the settings on the HVAC system, broken motors or fan belts. Many exhaust vents in classrooms were obstructed by items and furniture (Picture 4; Table 1). These obstructions should be removed for proper airflow. Also note that in many classrooms, the exhaust vents are located near the classroom doors. When the doors are open, the exhaust vents may draw air from the hallway rather than the classroom. For best operation of the ventilation system, hallway doors should be closed. Lack of exhaust ventilation, particularly in areas where

pollutants may be generated such as bathrooms, can allow odors, moisture and pollutants to build up.

To maximize air exchange, the IAQ program recommends that both supply and exhaust ventilation operate continuously during periods of occupancy. In order to have proper ventilation with a mechanical ventilation system, the systems must be balanced after installation to provide an adequate amount of fresh air to the interior of a room while removing stale air from the room. It is recommended that HVAC systems be re-balanced every five years to ensure adequate air systems function (SMACNA, 1994). It is not known when the systems were last balanced.

Temperature control complaints were expressed by some occupants. It is important that occupants have a system to make written requests for adjustments of the HVAC system to address heat, cold and noise complaints without turning off or blocking system components directly.

Some of the univents in the building are beyond their service life<sup>1</sup>. Efficient function of equipment of this age is difficult to maintain, since compatible replacement parts are often unavailable. According to the American Society of Heating, Refrigeration and Air-Conditioning Engineering (ASHRAE), the service life for the various components of the HVAC system is between 20 to 30 years, assuming routine maintenance of the equipment (ASHRAE, 1991).

### **Microbial/Moisture Concerns**

Water-damaged ceiling tiles were observed in a few areas (Picture 5; Table 1) which were attributed to roof leaks. Portions of the roof were repaired recently, meaning some of these damaged tiles are from historic leaks. Water-damaged ceiling tiles can provide a source of mold and should be replaced after a water leak is discovered and repaired. The library had multiple stained ceiling tiles. Library occupants expressed concerns regarding continuing roof leaks that occur during rainstorms. The library is carpeted and contains books and other porous materials that can become moldy if exposed to chronic moistening. Occupants in the library reported that odors occur from carpeting during rainstorms. The US Environmental Protection Agency (US EPA) and the American Conference of Governmental Industrial Hygienists (ACGIH)

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<sup>1</sup> The service life is the median time during which a particular system or component of ...[an HVAC]... system remains in its original service application and then is replaced. Replacement may occur for any reason, including, but not limited to, failure, general obsolescence, reduced reliability, excessive maintenance cost, and changed system requirements due to such influences as building characteristics or energy prices (ASHRAE, 1991).

recommends that porous materials (e.g., wallboard, carpeting) be dried with fans and heating within 24 to 48 hours of becoming wet (US EPA, 2008; ACGIH, 1989). If porous materials are not dried within this time frame, mold growth may occur.

Some classrooms and storage areas have sinks. Some sinks have gaps in the backsplash which can lead to water damage and microbial growth in the material of the cabinet (Picture 6; Table 1). Backsplash gaps should be sealed or replaced with a one-piece unit. Some had large amounts of material stored underneath, including porous materials (Picture 7). The area under sinks can be a damp environment and should be kept clear of porous items which may become mold-colonized. Note that sinks and other drains that are not used regularly (e.g. little-used storage areas, locker rooms) can have the drain traps dry, which can allow sewer odors into the building. Drains should either be moistened periodically to maintain the trap seal, or be capped to prevent the infiltration of sewer odor/gases into occupied areas.

Plants were noted in some classrooms (Table 1). Some plants were on univents or on porous materials. Plants should be well maintained, not overwatered and use non-porous drip pans. They should be kept away from the airstream of ventilation equipment to prevent the distribution of pollen, mold, dirt and odors.

Refrigerators were found in break rooms and some classrooms (Table 1). These appliances should be located in non-carpeted areas and should be kept clean and free from spills and spoiled food that can lead to odors. The gasket of one refrigerator was found stained with mold. Stained gaskets should be cleaned with an antimicrobial solution or replaced if they cannot be cleaned or no longer seal well.

The majority of the building, including the modular classroom area, has a crawlspace below the floor. According to building facility staff, there were significant moisture issues in the modular area crawlspace that were causing odors in the modular classrooms. Building staff examined the crawlspace and identified an inoperable sump pump used for the hand sinks in the modular area which overflowed. The overflow issue was corrected and the area cleaned which has reduced odors in occupied areas. This sump pump should be periodically monitored for function. An alarm to detect pump malfunction or high water level should also be installed to prevent a reoccurrence.

Facility staff reported that increased airflow will be introduced to this portion of the crawlspace through vents in the exterior wall, some of which will be fitted with fans to

depressurize the crawls space and remove odors and moisture. This fan will serve to draw air from occupied areas above into the crawlspace. In general, crawl spaces are damp areas with the potential for odors, mold and pests. Isolation of crawl spaces from occupied areas is also necessary, and includes sealing of any pathways between the crawlspace and occupied areas. Gaps around pipes that serve univents can be a frequent pathway between a crawlspace and the occupied areas above. Any such gaps should be sealed with an appropriate fire-rated sealant. Other gaps may include hatchways for utility service and holes around wiring.

The exterior of the building was examined for conditions that may lead to water infiltration or other IAQ concerns. Exterior doors had light visible between the door and the frame (Picture 8) which indicates that weather-stripping needs to be added or replaced to prevent moisture and pests from entering the building. The book storage room was originally a maintenance/storage area with a garage-type roll-up door. This type of door is not weather-tight and may be a source of unconditioned air, moisture and pests (Picture 9).

Some downspouts had been recently extended to direct water away from the base of the building (Picture 10), however a few terminated at the foundation (Picture 11). These should also be extended to drain water away from the building.

In a few areas, plants were observed near or against the exterior of the building (Picture 12). Plants can prevent the building from drying which may lead to damage, and plant roots may damage building foundations. Plants should be trimmed or removed to five feet away from the building.

### **Other Conditions**

Exposure to low levels of total volatile organic compounds (TVOCs) may produce eye, nose, throat, and/or respiratory irritation in some sensitive individuals. BEH/IAQ staff examined rooms for products containing VOCs. BEH/IAQ staff noted hand sanitizers, scented products, cleaners, and dry erase materials in use within the building (Picture 13; Table 1). These products have the potential to be irritants to the eyes, nose, throat, and respiratory system of sensitive individuals.

There are copy machines/printers in the building which can produce waste heat and irritating odors. VOCs and ozone can be produced by photocopiers, particularly if the equipment is older and in frequent use. Ozone is a respiratory irritant (Schmidt Etkin, D., 1992).

The MDPH recommends pleated filters with a Minimum Efficiency Reporting Value (MERV) of 8, which are adequate in filtering out pollen and mold spores (ASHRAE, 2012). Filters should also be changed two to four times a year, or per the manufacturer's instructions. Some univent cabinets had dust and debris in them (Picture 14). Univent cabinets should be vacuumed out periodically during filter changes to remove dust and debris that may cause odors when heated or aerosolized. Also note that the univent fresh air vents on the outside of the building need to be cleaned periodically to prevent the build-up of debris that can reduce effectiveness and cause odors to be drawn into classrooms.

In many areas, supply vents, exhaust vents and personal fans were dusty (Pictures 15 and 16; Table 1). This dust can be reaerosolized under certain conditions, and can also be a medium for mold growth.

Some areas of the school are carpeted. Carpeting is not recommended for high traffic or instructional areas of schools because it can be hard to keep clean, and may become a source of odors and mold if it gets wet. Carpeting is not recommended in areas subject to chronic moisture/condensation. In addition, carpeting in schools has a service life of approximately 10-11 years (IICRC, 2002).). Carpeting that is beyond its service life becomes increasingly difficult to clean and may release fibers which can be irritating if airborne. School staff reported that some carpeting in the school has already been removed and there is a program plan to remove and replace all the carpeting in classrooms and hallways over the next several years.

Carpets should be cleaned annually (or semi-annually in soiled/high traffic areas) in accordance with Institute of Inspection, Cleaning and Restoration Certification (IICRC) recommendations, (IICRC, 2012). Regular cleaning with a high efficiency particulate air (HEPA) filtered vacuum in combination with an annual cleaning will help to reduce accumulation and potential aerosolization of materials from carpeting. Area rugs were also observed in many classrooms (Table 1). Area carpets too worn to be effectively cleaned should be replaced. Area rugs should be rolled up and stored in a clean, dry place when rooms are not occupied during the summer months to prevent moistening due to condensation.

In many classrooms and particularly in storage areas, large numbers of items were on floors, windowsills, tabletops, counters, bookcases and desks, which provide a source for dusts to accumulate (Picture 17). These items (e.g., papers, folders, boxes) make it difficult for custodial

staff to clean. Items should be relocated and/or be cleaned periodically to avoid excessive dust build up and associated irritation.

Note that the Environmental Protection Agency (EPA) conducted a National School Radon Survey in which it discovered nearly one in five schools had “...at least one frequently occupied ground contact room with short-term radon levels above 4 [picocuries per liter] pCi/L” (US EPA 1993). The BEH/IAQ Program therefore recommends that every school be tested for radon, and that this testing be conducted during the heating season while school is in session in a manner consistent with USEPA radon testing guidelines. Radon measurement specialists and other information can be found at [www.nrsb.org](http://www.nrsb.org) and <http://aarst-nrpp.com/wp>, with additional information at: <http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/radon>.

## RECOMMENDATIONS

In view of the findings at the time of the visit, the following recommendations are made:

1. Operate the HVAC system to provide for *continuous* fresh air ventilation during occupied hours.
2. Remove furniture and items blocking the front and top of univents. Remove furniture and items from in front of exhaust vents.
3. Periodically assess whether exhaust vents (classrooms and restrooms) are drawing air and repair as needed.
4. Consider closing classroom doors in rooms with exhaust vents near the doors.
5. Use openable windows to supplement fresh air during temperate weather. Ensure all windows are closed tightly at the end of each day.
6. Work with staff to troubleshoot temperature control problems.
7. Utilize a system to report and track maintenance issues so that concerns can be reported by staff and maintenance staff can report when issues have been resolved.
8. Consider adopting a balancing schedule of every 5 years for all mechanical ventilation systems, as recommended by ventilation industrial standards (SMACNA, 1994).
9. For buildings in New England, periods of low relative humidity during the winter are often unavoidable. Therefore, scrupulous cleaning practices should be adopted to minimize common indoor air contaminants whose irritant effects can be enhanced when



the relative humidity is low. To control for dusts, a high efficiency particulate arrestance (HEPA) filter equipped vacuum cleaner in conjunction with wet wiping of all surfaces is recommended. Avoid the use of feather dusters. Drinking water during the day can help ease some symptoms associated with a dry environment (throat and sinus irritations).

10. Work with a roofing contractor/building engineer to investigate/repair building envelope leaks. Until this has been completed, avoid storing porous materials in areas of known leaks.
11. Consider replacement of library carpeting with non-porous flooring in areas where odors occur, particularly if deep cleaning does not resolve the issue.
12. Replace water-damaged ceiling tiles and inspect above them to clean/disinfect any additional moistened material.
13. Repair sink backsplashes with appropriate sealant or replace. Avoid storing porous items or large amounts of items under sinks.
14. Sinks and other fixtures that are not used regularly should have the drains moistened to ensure the traps function to prevent sewer gas from entering occupied areas. If fixtures are not needed long term, they should be properly sealed or removed and cut/capped.
15. Keep plants in good condition, avoid overwatering, and keep them away from the airstream of ventilation equipment.
16. Keep refrigerators clean of spills and spoiled food. Clean mold-stained gaskets with an antimicrobial solution or replace.
17. Periodically inspect the crawl space sump and pump for overflow and other issues. Consider installing an alarm to detect pump failure and/or water leakage.
18. Continue with plans to increase airflow in the crawlspace through ventilation and fans. When deciding where to install fans, consider prevailing wind direction, obstructions, and the location of supply air vents to avoid entraining air from the crawlspace into occupied areas.
19. Seal gaps between the crawlspace and occupied areas, including gaps around piping in univents.
20. Repair or replace weather-stripping on exterior doors for a tight fit that excludes unconditioned air and pests.

21. Seal the garage door in the book room with weather-stripping. Consider plans to replace this with a solid wall if it will continue to be occupied space.
22. Ensure downspouts direct water away from the building.
23. Trim back plants from the foundation approximately 5 feet, including in the courtyard.
24. Reduce or eliminate the use of air fresheners, scented cleaners, hand sanitizers and dry erase materials to reduce irritation. Consult the MDPH guidance “Clean Air is Odor-Free,” attached as [Appendix A](#), for more information.
25. Ensure copy machines, laminators and other appliances are used in areas with adequate ventilation and away from occupants.
26. Continue to change filters in HVAC units at least twice a year with MERV 8 or higher filters. Clean HVAC and univent cabinets of debris and dust when filters are changed.
27. Clean supply and exhaust vents and fans regularly to remove accumulated dust/debris.
28. Ensure that screens are installed on univent fresh air intake vents to prevent pest entry or debris accumulation.
29. Clean carpeting and rugs at least once per year according to IICRC recommendations (IICRC 2012). Area carpets too worn to be effectively cleaned should be replaced. Roll up and store area rugs in a clean, dry place during the summer.
30. Relocate or consider reducing the amount of materials stored in classrooms to allow for more thorough cleaning of classrooms. Plan regular clean-outs to remove and organize items in storerooms, particularly science storage areas. Clean items regularly with a wet cloth or sponge to prevent excessive dust build-up.
31. Continue to utilize the US EPA’s (2000), “Tools for Schools”, as an instrument for maintaining a good IAQ environment in the building available at: <http://www.epa.gov/iaq/schools/index.html>.
32. The school should be tested for radon by a certified radon measurement specialist during the heating season when school is in session. Radon measurement specialists and other information can be found at: [www.nrsb.org](http://www.nrsb.org), and <http://aarst-nrpp.com/wp>.
33. Refer to resource manuals and other related IAQ documents for further building-wide evaluations and advice on maintaining public buildings. Copies of these materials are located on the MDPH’s website: <http://mass.gov/dph/iaq>.

## REFERENCES

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**Picture 1**



**Unit ventilator (univent), note items on top and in front**

**Picture 2**



**Univent fresh air intakes**

**Picture 3**



**Univent obstructed with items/furniture**

**Picture 4**



**Significantly obstructed exhaust vent**



**Picture 5**



**Water-damaged ceiling tile**

**Picture 6**



**Damaged sealant between bottom and side of backsplash**

**Picture 7**



**Items, including porous items, under a classroom sink**

**Picture 8**



**Exterior door missing weather-stripping**

**Picture 9**



**Garage door in book room**

**Picture 10**



**Extended downspout**



**Picture 11**



**Downspout terminating next to the foundation**

**Picture 12**



**Plants next to the building**

**Picture 13**



**Air freshener and scented hand soap**

**Picture 14**



**Debris in univent grill**



**Picture 15**



**Heavy dust accumulation on exhaust vent**

**Picture 16**



**Dusty vent and ceiling tiles in a modular classroom**

**Picture 17**



**Items in a storage closet**

**Location: Claypit Hill Elementary**

**Address: 40 Adams Lane, Wayland, MA**

**Indoor Air Results**

**Date: 3/1/19**

**Table 1**

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m <sup>3</sup> )	Occupants in Room	Windows Openable	Ventilation		Remarks
								Supply	Exhaust	
Background (outside)	387	ND	46	15	4					Sunny
BASE room	719	ND	70	12	5	0	N	Y	Y	Carpet, UF, humidifier
Cooling room	618	ND	70	14	4	0	N	N	N	Area rug
Gym	713	ND	70	19	5	~30	Doors to outside	Y	Y	DEM
Music room 1	643	ND	69	16	6	0	Y	Y	Y	3 WD CT, NC
Room 1	860	ND	69	11	10	1 class just left	Y	Y	Y	Mats, DEM, CP, HS, carpet, sink, WD CT
Room 2	805	ND	62	21	6	1	Y	Y	Y	Carpet, DEM, sink, books
Room 3	1020	ND	70	25	6	0	Y	Y	Y	Dusty vents, sink with items under, DEM, carpet and area rug, HS, CP,
Room 4	--	ND	70	--	9	22	Y	Y	Y	Carpet and area rug (soiled), DEM, sink, HS
Stage rear	689	ND	69	21	4	0	N	Y	Y	2 WD CT, NC

ppm = parts per million

µg/m<sup>3</sup> = micrograms per cubic meter

AF = air freshener

AI = accumulated items

CP = cleaning products

CT = ceiling tile

DEM = dry erase materials

HS = hand sanitizer

MT = missing tile

NC = not carpeted

ND = non detect

PF = personal fan

TB = tennis balls

UF = upholstered furniture

UV = univent

WD = water-damaged

#### Comfort Guidelines

Carbon Dioxide: < 800 ppm = preferable  
> 800 ppm = indicative of ventilation problems

Temperature: 70 - 78 °F  
Relative Humidity: 40 - 60%

Location: Claypit Hill Elementary

Address: 40 Adams Lane, Wayland, MA

Indoor Air Results

Date: 3/1/19

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m <sup>3</sup> )	Occupants in Room	Windows Openable	Ventilation		Remarks
								Supply	Exhaust	
102	871	ND	71	16	4	18	Y	Y	Y	Univent on, obstructed, area rug, doors, exhaust very dusty under cover – on but obstructed
103	966	ND	71	19	3	17	Y	Y	Y	UV
104	922	ND	71	18	4	12	Y	Y	Y	UV blocked
105 kindergarten	875	ND	70	16	4	17	Y	Y	Y	Exhaust on, dusty, 2 doors, toilet room, sink backsplash gap, NC with area rug, art supplies
106	561	ND	71	16	3	1	Y	Y	Y off	UV, DEM, plant, area rug
107	1148	ND	72	18	3	20	Y	Y	Y	HS, UV
108	1148	ND	72	16	1	15	Y	Y	Y	Area rug, sink, DEM, exhaust on and obstructed
109	1154	ND	73	19	ND	0	y	Y	Y	2 area rugs, sink with backsplash gap, PF
110	1100	ND	72	16	2	16	Y	Y	Y	HS, PF, sink backsplash, exhaust off
111	1224	ND	72	19	2	15	Y	Y	Y	HS, AI, UV and exhaust blocked

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								Supply	Exhaust	
112	1151	ND	75	16	2	18	Y	Y	Y	PF – dusty, exhaust on -- dusty, area rug, door open, items under sink
113	1204	ND	72	20	3	17	Y	Y	Y	HS, UV, AI
114	965	ND	73	13	1	18	Y	Y	Y	Exhaust off, dusty, area rug, DEM, HS, sink
115	940	ND	72	13	1	3	N	Y	Y	Exhaust on
117	1028	ND	70	18	3	21	Y	Y	Y	CPs, AF, UV exhaust vent blocked
118	943	ND	73	14	1	0	Y	Y	Y	Area rug, exhaust obstructed
120	1164	ND	70	20	2	18	Y	Y	Y	Area rug, exhaust off
121	1050	ND	70	17	ND	0	Y	Y	Y	Area rug, TBs (a few), DEM, exhaust off and obstructed
122	1188	ND	71	21	4	19	Y	Y	Y off	HS, DEM, UV area rug
123	1121	ND	69	21	3	1	Y	Y	Y off	HS, DEM, UV temperature complaints

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								Supply	Exhaust	
124	737	ND	71	15	6	5	Y	Y	Y	UV blocked, CPs, HS, WD CT
125	587	ND	71	11	ND	0	Y	Y	Y	1 WD CT, area rug, exhaust on
126	743	ND	71	15	4	3	Y	Y	Y	UV, CPs, DEM, WD CT, HS
127	588	ND	71	10	1	0	Y	Y	Y	Cleaner odor/AF, univent dust/debris
128	1047	ND	70	15	ND	0	Y	Y	Y	Sink, area rug, DEM, sink backsplash gap
128	923	ND	70	16	5	0	Y	Y	Y	DEM, UV, CPs, area rug
129	941	ND	71	18	ND	20	Y	Y	Y	Area rug, sink
Art	863	ND	70	19	2	19	Y	Y	Y	UV blocked, slight musty odor near kiln/sink area (accumulated dust)
Art Closet							N	N		Art supplies – mostly not on floor, damaged flooring
Book room	1004	ND	71	15	1	0	N	N	N	Garage door, electric garage heater
C	928	ND	72	15	4	7	N	Y	Y	PF, AI, UV

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Temperature: 70 - 78 °F  
Relative Humidity: 40 - 60%



Location: Claypit Hill Elementary

Address: 40 Adams Lane, Wayland, MA

Indoor Air Results

Date: 3/1/19

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m <sup>3</sup> )	Occupants in Room	Windows Openable	Ventilation		Remarks
								Supply	Exhaust	
Cafeteria	693	ND	72	13	7	50+	N	Y	Y	
Colbert tech	1117	ND	72	19	3	22	N	Y	Y	Computers, area carpet
Conference	651	ND	71	15	3	0	N	N	Y	NC, area carpet
EL	573	ND	70	13	3	1	Y	Y	Y on	DEM, plants, UV blocked/off (cold air complaints)
Guidance 2	990	ND	71	19	4	1	N	Y	Y	Personal heater
Guidance-McManus	884	ND	69	17	4	6	N	Y	Y off	
Gym office	808	ND	68	23	1	0	N	N	N	WD CT, HS
Hall near 109	1262	ND	72	21	6	30+	N	N	Y	
Hehir	794	ND	71	15	3	2	Y	Y	Y	Plants
Library	885	ND	71	14	1	2	N	Y	Y	Several WD CT (acoustic type), reported carpet odor when leaks/wet weather, DEM, books

ppm = parts per million

µg/m<sup>3</sup> = micrograms per cubic meter

AF = air freshener

AI = accumulated items

CP = cleaning products

CT = ceiling tile

DEM = dry erase materials

HS = hand sanitizer

MT = missing tile

NC = not carpeted

ND = non detect

PF = personal fan

TB = tennis balls

UF = upholstered furniture

UV = univent

WD = water-damaged

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								Supply	Exhaust	
Library OT/PT room	799	ND	71	13	ND	3	Y	Y	Y	Area rug and mats, PF, sink
Main Office	635	ND	71	14	2	5	Y	Y	Y	NC, PC, UV
METCO	750	ND	70	12	ND	0	N	N	Y	DEM, exhaust off
Music 2	782	ND	75	12	2	19	N	Y	Y	Room has own HVAC, reported temperature issues, DEM, large area rug, DEM, sink backsplash is wooden, HS, CP
Music office 2	608	ND	66	19	2	1	N	Y	N	WD CTs x 3
Nurse	641	ND	75	11	3	3	Y	Y	N	No exhaust vent, sink
OT/PT	586	ND	72	11	3	0	N	Y	Y	MT and ajar CT
Principal	662	ND	71	15	3	2	Y	Y	Y	Plants
Reading	791	ND	72	17	5	1	N	Y	Y	Carpet, pathways in ceiling
Reading resource	1094	ND	71	15	0	0	N	Y	Y	PF, area rug, makeshift air supply from next room

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								Supply	Exhaust	
Server room	-	-	-	-	-	-	-	-	-	WD CTs
SPED Room	756	ND	70	13	1	0	N	Y	Y	Carpet
Teacher's lunch	647	ND	74	11	4	1	Y	Y	Y	Stove, sink backsplash gap, food, 2 ajar CTs, fridge and microwave and toaster, exhaust on
Teacher's room	1036	ND	71	16	5	2	N	N	Y	Ceiling fan, door open
Teacher's work	1116	ND	71	17	ND	5	N	N	N	DEM
Tech room	1053	ND	71	16	ND	0	N	Y	Y	Area rug, DO, low ceiling, computers
Testing room	655	ND	69	16	4	0	Y	Y	Y off	MT, Personal heater

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